AR

REF: 1101-A-000312

KAISER•HILL COMPANY

August 6, 2003

The purpose of these replacement pages is to correct typos in the header and the date (2002-2003) on the front cover

For the document entitled, "**Data Summary Report for IHSS Groups 000-1, Solar Ponds**," issued in June 2003, please make the following page replacements using those provided

1) Replace front cover with correctly dated one supplied
2) Replace pages 32 (Section 4 0 Data Quality Assessment) to the end of the document with those supplied, which have corrected headers and page numbers

If you have any questions, please contact either Marla Broussard at x6007 or Karen Griggs at x4743

Thank you

1/19

Kaiser-Hill Company, L L C
Rocky Flats Environmental Technology Site, 10808 Hwy 93 Unit B, Golden, CO 80403-8200 • 303-966-7000

KAISER•HILL
COMPANY

Data Summary Report
IHSS Group 000-1

June 2003

2

4.0 DATA QUALITY ASSESSMENT

The Data Quality Objectives (DQOs) for this project are described in the IASAP (DOE 2002) All DQOs for this project were achieved based on the following

- Regulatory agency approved sampling program design (IASAP Addendum 02-01 [DOE 2002a),
- Collection of samples in accordance with the sampling design,
- Results of the Data Quality Assessment as described in the following sections

4 1 1 Data Quality Assessment Process

The DQA process ensures that the type, quantity and quality of environmental data used in decision making are defensible, and is based on the following guidance and requirements

- EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process,
- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process, Practical Methods for Data Analysis, and
- DOE Order 414 1A, 1999, Quality Assurance

Verification and Validation (V&V) of the data are the primary components of the DQA The final data are compared with original project DQOs and evaluated with respect to project decisions, uncertainty within the decisions, and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) Validation criteria are consistent with the following RFETS-specific documents and industry guidelines

- EPA 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review,
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, and
- Kaiser-Hill Company, L L C (K-H) V&V Guidelines
- General Guidelines for Data Verification and Validation, DA-GR01-v2, 2002a
- V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v2, 2002b
- V&V Guidelines for Volatile Organics, DA-SS01-v3, 2002c
- V&V Guidelines for Semivolatile Organics, DA-SS02-v3, 2002d

3

- V&V Guidelines for Metals, DA-SS05-v3, 2002e
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5

This report will be submitted to the Comprehensive Environmental, Response, Compensation and Liability Act (CERCLA) Administrative Record (AR) for permanent storage 30 days after being provided to CDPHE and/or U S EPA

4 1 2 Verification and Validation of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly The V&V process defines the criteria that constitute data quality, namely PARCCS parameters Data traceability and archival are also addressed V&V criteria include the following

- Chain-of-custody,
- Preservation and hold-times,
- Instrument calibrations,
- Preparation blanks,
- Interference check samples (metals),
- Matrix spikes/matrix spike duplicates (MS/MSD),
- Laboratory control samples (LCS),
- Field duplicate measurements,
- Chemical yield (radiochemistry),
- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively), and
- Sample analysis and preparation methods

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (i e , within tolerances acceptable to the project) Satisfactory V&V of laboratory quality controls are captured through application of validation "flags" or qualifiers to individual records

Raw hardcopy data (e g , individual analytical data packages) are currently filed by RIN and are maintained by Kaiser-Hill Analytical Services Division, older hardcopies may reside in the Federal Center in Lakewood, Colorado Electronic data are stored in the RFETS Soil and Water Database (SWD)

Both quality control (QC) and real data, as of May 22, 2003, are included on the enclosed CD, Microsoft ACCESS 2000 format

4 1 3 Accuracy

The following measures of accuracy were evaluated

- Laboratory Control Sample Evaluation,
- Surrogate Evaluation,
- Blanks, and
- Sample Matrix Spike Evaluation

Results are compared to method requirements and project goals The results of these comparisons are summarized for RFCA COCs where the result could impact project decisions Particular attention is paid to those values near ALs when quality control (QC) results could indicate unacceptable levels of uncertainty for decision-making purposes

Laboratory Control Sample Evaluation

The frequency of Laboratory Control Sample (LCS) measurements, relative to each laboratory batch, is given in Table 6 LCS frequency was adequate based on at least one LCS per batch The minimum and maximum LCS results are also tabulated, by chemical and method, for the entire project While not all LCS results are within tolerances, project decisions based on AL exceedances were not affected Any qualifications of results due to LCS performance exceeding upper or lower tolerance limits are captured in the V&V flags, described in the Completeness Section

Surrogate Evaluation

The frequency of surrogate measurements is given in Table 7 Surrogate frequency was adequate based on at least one analysis per sample The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project Any qualifications of results due to surrogate results are captured in the V&V flags, described in the Completeness Section

Blank Evaluation

Detectable amounts of contaminants within the blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminant is detected in the associated real samples When the real result is less than 10 times the blank result for laboratory contaminants, or less than 5 times the result for non-laboratory contaminants, the real result is eliminated None of the chemicals detected in blanks (Table 8) were detected at concentrations in real samples greater than ALs, therefore no significant blank contamination is indicated

Table 6
Laboratory Control Sample Evaluation

CAS Number	Analyte	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Laboratory Test Method
75-35-4	1,1-DICHLOROETHENE	93	101	2	2	%REC	SW-846 8260
120-82-1	1,2,4-TRICHLOROBENZENE	49	61	2	2	%REC	SW-846 8270
39638-32-9	2,2'-OXYBIS(1-CHLOROPROPANE)	51	68	2	2	%REC	SW-846 8270
95-95-4	2,4,5-TRICHLOROPHENOL	53	65	2	2	%REC	SW-846 8270
88-06-2	2,4,6-TRICHLOROPHENOL	52	70	2	2	%REC	SW-846 8270
120-83-2	2,4-DICHLOROPHENOL	54	68	2	2	%REC	SW-846 8270
105-67-9	2,4-DIMETHYLPHENOL	53	66	2	2	%REC	SW-846 8270
51-28-5	2,4-DINITROPHENOL	56	80	2	2	%REC	SW-846 8270
121-14-2	2,4-DINITROTOLUENE	54	67	2	2	%REC	SW-846 8270
606-20-2	2,6-DINITROTOLUENE	52	68	2	2	%REC	SW-846 8270
91-58-7	2-CHLORONAPHTHALENE	50	61	2	2	%REC	SW-846 8270
95-57-8	2-CHLOROPHENOL	54	70	2	2	%REC	SW-846 8270
91-57-6	2-METHYLNAPHTHALENE	51	64	2	2	%REC	SW-846 8270
95-48-7	2-METHYLPHENOL	54	68	2	2	%REC	SW-846 8270
88-74-4	2-NITROANILINE	56	71	2	2	%REC	SW-846 8270
91-94-1	3,3'-DICHLOROBENZIDINE	33	45	2	2	%REC	SW-846 8270
534-52-1	4,6-DINITRO-O-CRESOL	56	67	2	2	%REC	SW-846 8270
106-47-8	4-CHLOROANILINE	24	34	2	2	%REC	SW-846 8270
106-44-5	4-METHYLPHENOL	54	71	2	2	%REC	SW-846 8270
83-32-9	ACENAPHTHENE	52	65	2	2	%REC	SW-846 8270
120-12-7	ANTHRACENE	48	67	2	2	%REC	SW-846 8270
12674-11-2	AROCLOR-1016	93	93	1	1	%REC	SW-846 8082
11096-82-5	AROCLOR-1260	96	96	1	1	%REC	SW-846 8082
100-51-6	BENYZL ALCOHOL	52	69	2	2	%REC	SW-846 8270

Table 6
Laboratory Control Sample Evaluation

CAS Number	Analyte	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Laboratory Test Method
71-43-2	BENZENE	112	120	2	2	%REC	SW-846 8260
56-55-3	BENZO(A)ANTHRACENE	48	64	2	2	%REC	SW-846 8270
50-32-8	BENZO(A)PYRENE	48	65	2	2	%REC	SW-846 8270
205-99-2	BENZO(B)FLUORANTHENE	48	66	2	2	%REC	SW-846 8270
207-08-9	BENZO(K)FLUORANTHENE	51	65	2	2	%REC	SW-846 8270
65-85-0	BENZOIC ACID	42	50	2	2	%REC	SW-846 8270
111-44-4	BIS(2-CHLOROETHYL) ETHER	51	72	2	2	%REC	SW-846 8270
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	52	69	2	2	%REC	SW-846 8270
85-68-7	BUTYLBENZYLPHTHALATE	51	69	2	2	%REC	SW-846 8270
108-90-7	CHLOROBENZENE	95	105	2	2	%REC	SW-846 8260
218-01-9	CHRYSENE	48	64	2	2	%REC	SW-846 8270
53-70-3	DIBENZ(A,H)ANTHRACENE	47	66	2	2	%REC	SW-846 8270
132-64-9	DIBENZOFURAN	52	64	2	2	%REC	SW-846 8270
84-66-2	DIETHYL PHTHALATE	55	66	2	2	%REC	SW-846 8270
131-11-3	DIMETHYL PHTHALATE	53	65	2	2	%REC	SW-846 8270
84-74-2	DI-N-BUTYL PHTHALATE	51	70	2	2	%REC	SW-846 8270
117-84-0	DI-N-OCTYL PHTHALATE	48	65	2	2	%REC	SW-846 8270
206-44-0	FLUORANTHENE	50	66	2	2	%REC	SW-846 8270
86-73-7	FLUORENE	52	63	2	2	%REC	SW-846 8270
118-74-1	HEXACHLOROBENZENE	49	64	2	2	%REC	SW-846 8270
87-68-3	HEXACHLOROBUTADIENE	50	61	2	2	%REC	SW-846 8270
77-47-4	HEXACHLOROCYCLOPENTADIENE	37	47	2	2	%REC	SW-846 8270
67-72-1	HEXACHLOROETHANE	50	63	2	2	%REC	SW-846 8270

Table 6
Laboratory Control Sample Evaluation

CAS Number	Analyte	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Laboratory Test Method
193-39-5	INDENO(1,2,3-CD)PYRENE	47	66	2	2	%REC	SW-846 8270
78-59-1	ISOPHORONE	59	76	2	2	%REC	SW-846 8270
91-20-3	NAPHTHALENE	51	63	2	2	%REC	SW-846 8270
98-95-3	NITROBENZENE	53	68	2	2	%REC	SW-846 8270
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	53	70	2	2	%REC	SW-846 8270
86-30-6	N-NITROSODIPHENYLAMINE	61	75	2	2	%REC	SW-846 8270
87-86-5	PENTACHLOROPHENOL	37	56	2	2	%REC	SW-846 8270
108-95-2	PHENOL	55	70	2	2	%REC	SW-846 8270
100-02-7	P-NITROPHENOL	52	66	2	2	%REC	SW-846 8270
129-00-0	PYRENE	47	61	2	2	%REC	SW-846 8270
108-88-3	TOLUENE	94	102	2	2	%REC	SW-846 8260
79-01-6	TRICHLOROETHENE	103	114	2	2	%REC	SW-846 8260

Table 7
Surrogate Recovery Summary

VOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum	Maximum	Unit Code
6	1,2-DICHLOROETHANE-D4	97	105	%REC
6	4-BROMOFLUOROBENZENE	101	105	%REC
6	TOLUENE-D8	96	98	%REC
SVOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum	Maximum	Unit Code
24	TERPHENYL-D14	51	67	%REC
24	2-FLUOROBIPHENYL	45	65	%REC
24	2-FLUOROPHENOL	39	65	%REC
24	NITROBENZENE-D5	38	69	%REC

Table 8
Field Blank Summary

Sample QC Code	Test Method Name	Analyte	Maximum Detected Value	Unit
RB	GAMMA	Uranium-235	0 16	pCi/g
RB	GAMMA	Uranium-238	3	pCi/g

Sample Matrix Spike Evaluation

The frequency of MS measurements was adequate based on at least one MS per batch The minimum and maximum MS results are summarized by chemical, for the entire project in Table 9 MS recoveries alone do not result in rejection of data, any qualifications due to matrix spike performance are included in the validation flags summarized in the Completeness section

Table 9
Sample Matrix Spike Evaluation

CAS Number	Analyte	Minimum	Maximum	Number of Lab Samples	Number of Lab Batches	Unit	Lab Method
75-35-4	1,1-DICHLOROETHENE	96	96	1	1	%REC	SW-846 8260
120-82-1	1,2,4-TRICHLOROBENZENE	42	47	2	2	%REC	SW-846 8270
95-95-4	2,4,5-TRICHLOROPHENOL	50	50	2	2	%REC	SW-846 8270
88-06-2	2,4,6-TRICHLOROPHENOL	49	52	2	2	%REC	SW-846 8270
120-83-2	2,4-DICHLOROPHENOL	49	54	2	2	%REC	SW-846 8270
105-67-9	2,4-DIMETHYLPHENOL	50	55	2	2	%REC	SW-846 8270
51-28-5	2,4-DINITROPHENOL	40	45	2	2	%REC	SW-846 8270
121-14-2	2,4-DINITROTOLUENE	54	56	2	2	%REC	SW-846 8270

Table 9
Sample Matrix Spike Evaluation

CAS Number	Analyte	Minimum	Maximum	Number of Lab Samples	Number of Lab Batches	Unit	Lab Method
606-20-2	2,6-DINITROTOLUENE	51	54	2	2	%REC	SW-846 8270
91-58-7	2-CHLORONAPHTHALENE	45	50	2	2	%REC	SW-846 8270
95-57-8	2-CHLOROPHENOL	47	53	2	2	%REC	SW-846 8270 -
91-57-6	2-METHYLNAPHTHALENE	46	50	2	2	%REC	SW-846 8270
95-48-7	2-METHYLPHENOL	47	54	2	2	%REC	SW-846 8270
88-74-4	2-NITROANILINE	53	59	2	2	%REC	SW-846 8270
91-94-1	3,3'-DICHLOROBENZIDINE	38	40	2	2	%REC	SW-846 8270
534-52-1	4,6-DINITRO-O-CRESOL	39	54	2	2	%REC	SW-846 8270
106-47-8	4-CHLOROANILINE	31	34	2	2	%REC	SW-846 8270
106-44-5	4-METHYLPHENOL	48	55	2	2	%REC	SW-846 8270
83-32-9	ACENAPHTHENE	49	51	2	2	%REC	SW-846 8270
120-12-7	ANTHRACENE	50	53	2	2	%REC	SW-846 8270
12674-11-2	AROCLOR-1016	91	91	1	1	%REC	SW-846 8082
11096-82-5	AROCLOR-1260	83	83	1	1	%REC	SW-846 8082
100-51-6	BENYZL ALCOHOL	46	54	2	2	%REC	SW-846 8270
71-43-2	BENZENE	106	106	1	1	%REC	SW-846 8260
56-55-3	BENZO(A)ANTHRACENE	48	55	2	2	%REC	SW-846 8270
50-32-8	BENZO(A)PYRENE	50	53	2	2	%REC	SW-846 8270
205-99-2	BENZO(B)FLUORANTHENE	50	51	2	2	%REC	SW-846 8270
207-08-9	BENZO(K)FLUORANTHENE	51	51	2	2	%REC	SW-846 8270
65-85-0	BENZOIC ACID	19	30	2	2	%REC	SW-846 8270
111-44-4	BIS(2-CHLOROETHYL) ETHER	43	56	2	2	%REC	SW-846 8270
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	42	51	2	2	%REC	SW-846 8270
85-68-7	BUTYLBENZYLPHTHALATE	52	61	2	2	%REC	SW-846 8270
108-90-7	CHLOROBENZENE	95	95	1	1	%REC	SW-846 8260
218-01-9	CHRYSENE	48	51	2	2	%REC	SW-846 8270
53-70-3	DIBENZ(A,H)ANTHRACENE	47	53	2	2	%REC	SW-846 8270

Table 9
Sample Matrix Spike Evaluation

CAS Number	Analyte	Minimum	Maximum	Number of Lab Samples	Number of Lab Batches	Unit	Lab Method
132-64-9	DIBENZOFURAN	49	51	2	2	%REC	SW-846 8270
84-66-2	DIETHYL PHTHALATE	53	54	2	2	%REC	SW-846 8270
131-11-3	DIMETHYL PHTHALATE	50	55	2	2	%REC	SW-846 8270
84-74-2	DI-N-BUTYL PHTHALATE	51	61	2	2	%REC	SW-846 8270
117-84-0	DI-N-OCTYL PHTHALATE	48	60	2	2	%REC	SW-846 8270
206-44-0	FLUORANTHENE	52	56	2	2	%REC	SW-846 8270
86-73-7	FLUORENE	48	50	2	2	%REC	SW-846 8270
118-74-1	HEXACHLOROBENZENE	48	50	2	2	%REC	SW-846 8270
87-68-3	HEXACHLOROBUTADIENE	43	47	2	2	%REC	SW-846 8270
77-47-4	HEXACHLOROCYCLOPENTADIENE	28	35	2	2	%REC	SW-846 8270
67-72-1	HEXACHLOROETHANE	43	46	2	2	%REC	SW-846 8270
193-39-5	INDENO(1,2,3-CD)PYRENE	48	53	2	2	%REC	SW-846 8270
78-59-1	ISOPHORONE	53	61	2	2	%REC	SW-846 8270
91-20-3	NAPHTHALENE	45	49	2	2	%REC	SW-846 8270
98-95-3	NITROBENZENE	45	51	2	2	%REC	SW-846 8270
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	46	54	2	2	%REC	SW-846 8270
86-30-6	N-NITROSODIPHENYLAMINE	57	58	2	2	%REC	SW-846 8270
87-86-5	PENTACHLOROPHENOL	36	44	2	2	%REC	SW-846 8270
108-95-2	PHENOL	48	54	2	2	%REC	SW-846 8270
100-02-7	P-NITROPHENOL	50	50	2	2	%REC	SW-846 8270
129-00-0	PYRENE	48	50	2	2	%REC	SW-846 8270
108-88-3	TOLUENE	97	97	1	1	%REC	SW-846 8260
79-01-6	TRICHLOROETHENE	107	107	1	1	%REC	SW-846 8260

4 1 4 Precision

Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSD The frequency of MSD measurements was adequate based on at least one MS per batch (Table 10) Relative

percent differences (RPDs) exceeding 35 percent do not affect project decisions because all related real sample results (Table 11) were repeatable below ALs

Table 10
Sample Matrix Spike Duplicate Evaluation

Analyte Name	Number of Sample Pairs	Number of Laboratory Batches	Max RPD (%)
1,1-DICHLOROETHENE	1	1	5
1,2,4-TRICHLOROBENZENE	2	2	10
2,4,5-TRICHLOROPHENOL	2	2	10
2,4,6-TRICHLOROPHENOL	2	2	11
2,4-DICHLOROPHENOL	2	2	7
2,4-DIMETHYLPHENOL	2	2	9
2,4-DINITROPHENOL	2	2	26
2,4-DINITROTOLUENE	2	2	12
2,6-DINITROTOLUENE	2	2	17
2-CHLORONAPHTHALENE	2	2	8
2-CHLOROPHENOL	2	2	17
2-METHYLNAPHTHALENE	2	2	11
2-METHYLPHENOL	2	2	14
2-NITROANILINE	2	2	7
3,3'-DICHLOROBENZIDINE	2	2	81
4,6-DINITRO-O-CRESOL	2	2	23
4-CHLOROANILINE	2	2	25
4-METHYLPHENOL	2	2	12
ACENAPHTHENE	2	2	6
ANTHRACENE	2	2	6
AROCLOR-1016	1	1	1
AROCLOR-1260	1	1	1
BENYZL ALCOHOL	2	2	14
BENZENE	1	1	2
BENZO(A)ANTHRACENE	2	2	4
BENZO(A)PYRENE	2	2	4
BENZO(B)FLUORANTHENE	2	2	11
BENZO(K)FLUORANTHENE	2	2	2
BENZOIC ACID	2	2	71
BIS(2-CHLOROETHYL) ETHER	2	2	22
BIS(2-ETHYLHEXYL)PHTHALATE	2	2	96
BUTYLBENZYLPHTHALATE	2	2	6
CHLOROBENZENE	1	1	4
CHRYSENE	2	2	4
DIBENZ(A,H)ANTHRACENE	2	2	7
DIBENZOFURAN	2	2	8

Table 10
Sample Matrix Spike Duplicate Evaluation

Analyte Name	Number of Sample Pairs	Number of Laboratory Batches	Max RPD (%)
DIETHYL PHTHALATE	2	2	14
DIMETHYL PHTHALATE	2	2	9
DI-N-BUTYL PHTHALATE	2	2	8
DI-N-OCTYL PHTHALATE	2	2	13
FLUORANTHENE	2	2	9
FLUORENE	2	2	12
HEXACHLOROBENZENE	2	2	4
HEXACHLOROBUTADIENE	2	2	6
HEXACHLOROCYCLOPENTADIENE	2	2	4
HEXACHLOROETHANE	2	2	18
INDENO(1,2,3-CD)PYRENE	2	2	6
ISOPHORONE	2	2	12
NAPHTHALENE	2	2	13
NITROBENZENE	2	2	19
N-NITROSO-DI-N-PROPYLAMINE	2	2	20
N-NITROSODIPHENYLAMINE	2	2	8
PENTACHLOROPHENOL	2	2	13
PHENOL	2	2	18
P-NITROPHENOL	2	2	20
PYRENE	2	2	6
TOLUENE	1	1	2
TRICHLOROETHENE	1	1	4

Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent Table 11 indicates that duplicate sampling frequencies were adequate except for PCBs and SVOCs

A common metric for evaluating precision is the RPD value, RPD values are given in Table 12 Ideally, RPDs of less than 35 percent (in soil) indicate satisfactory precision Values exceeding 35 percent only affect project decisions if the imprecision is great enough to cause contradictory decisions relative to the COC (i e , one sample indicates clean soil whereas the QC partner does not) Those analytes exceeding 35% RPD were either repeatable to concentrations below action levels, which does not impact project decisions, or, if any sample result exceeded an action level, the concentration was considered real, and not due to sampling imprecision (e g , arsenic)

13

Table 11
Field Duplicate Sample Frequency

Test Method Name	Sample Code	Number of Samples	% Duplicate Samples
GAMMA SPECTROSCOPY	REAL	24	8
GAMMA SPECTROSCOPY	DUP	2	
SW-846 6200	REAL	30	7
SW-846 6200	DUP	2	
SW-846 8082	REAL	2	0
SW-846 8260	REAL	1	100
SW-846 8260	DUP	1	
SW-846 8270	REAL	23	4
SW-846 8270	DUP	1	

Table 12
RPD Evaluation

Analyte	Maximum Result of RPD
1,1,1-TRICHLOROETHANE	5
1,1,2,2-TETRACHLOROETHANE	5
1,1,2-TRICHLOROETHANE	5
1,1-DICHLOROETHANE	5
1,1-DICHLOROETHENE	5
1,2,4-TRICHLOROBENZENE	5
1,2-DICHLOROETHANE	5
1,2-DICHLOROPROPANE	5
2,4,5-TRICHLOROPHENOL	0
2,4,6-TRICHLOROPHENOL	0
2,4-DICHLOROPHENOL	0
2,4-DIMETHYLPHENOL	0
2,4-DINITROPHENOL	0
2,4-DINITROTOLUENE	0
2,6-DINITROTOLUENE	0
2-BUTANONE	4
2-CHLORONAPHTHALENE	0
2-CHLOROPHENOL	0
2-NITROANILINE	0
4-CHLOROANILINE	0
4-METHYL-2-PENTANONE	4
ACENAPHTHENE	0
ACETONE	4
ANTHRACENE	0

14

Table 12
RPD Evaluation

Analyte	Maximum Result of RPD
ANTIMONY	0
ARSENIC	125
BARIUM	72
BENZENE	5
BENZO(A)ANTHRACENE	49
BENZO(A)PYRENE	45
BENZO(B)FLUORANTHENE	158
BENZO(K)FLUORANTHENE	48
BENZOIC ACID	0
BIS(2-ETHYLHEXYL)PHTHALATE	0
BROMODICHLOROMETHANE	5
BROMOFORM	5
BROMOMETHANE	5
BUTYLBENZYLPHTHALATE	0
CARBON DISULFIDE	5
CARBON TETRACHLORIDE	5
CHLOROBENZENE	5
CHLOROETHANE	5
CHLOROFORM	5
CHLOROMETHANE	5
CHRYSENE	53
CIS-1,3-DICHLOROPROPENE	5
COBALT	0
COPPER	82
DIBENZ(A,H)ANTHRACENE	0
DIBENZOFURAN	0
DIBROMOCHLOROMETHANE	5
ETHYLBENZENE	5
FLUORANTHENE	45
FLUORENE	0
HEXACHLOROBENZENE	0
HEXACHLOROBUTADIENE	5
HEXACHLOROCYCLOPENTADIENE	0
HEXACHLOROETHANE	0
INDENO(1,2,3-CD)PYRENE	164
IRON	107
ISOPHORONE	0
LEAD	127
MANGANESE	178

15

Table 12
RPD Evaluation

Analyte	Maximum Result of RPD
METHYLENE CHLORIDE	5
MOLYBDENUM	0
NAPHTHALENE	5
NICKEL	133
NITROBENZENE	0
N-NITROSODIPHENYLAMINE	0
PENTACHLOROPHENOL	0
PHENOL	0
PYRENE	43
SELENIUM	27
SILVER	0
STRONTIUM	55
TETRACHLOROETHENE	5
TIN	42
TOLUENE	5
TRANS-1,3-DICHLOROPROPENE	5
TRICHLOROETHENE	5
VANADIUM	58
VINYL CHLORIDE	5
ZINC	81

Completeness

Based on the project's DQOs, a minimum of 25% of the Environmental Restoration (ER) Program's analytical (and radiological) results are targeted for formal validation Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements Table 13 shows the number of validated records (codes without "1"), verified records (codes with "1"), and rejected records for each analytical group

Frequency goals were not attained for any analyte groups within the project However, validation frequency of radionuclides via alpha spectroscopy is better than 25% for the ER Program as a whole (i e , ~52%), as are PCBs (27%) and ICP metals (58%) Spot checks on flags applied to radionuclide results via gamma spectroscopy *in hardcopy packages* indicate at least a 25% frequency, but those flags have not yet been uploaded to the digital records in the RFETS SWD Frequency percentages for VOCs and SVOCs are slightly behind program goals, at 23% and 20%, respectively, but should exceed 25% before completion of site closure

If additional V&V information is received, IHSSs 101, 165 and 176 records will be updated in the Soil and Water Database Frequency of data qualification and inferences from it will also be assessed as part of the Comprehensive Risk Assessment

16

4 1 5 Sensitivity

Reporting limits, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides, were compared with RFCA WRW and Ecological Receptor ALs Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions "Adequate" sensitivity is defined as a reporting limit less than an analyte's associated AL, typically less than one-half the AL

4 1 6 Summary of Data Quality

Data quality is acceptable for project decisions based on the V&V criteria cited and with the qualifications given

17

Table 13
Validation and Verification Summary

Validation Qualifier Code	Number of Records	Radionuclides	SW6010 (Metals)	SW8082 (PCBs)	SW8260 (VOCs)	SW8270 (SVOCs)
No V&V	464	464	0	0	0	0
J1	309	0	308	0	0	1
U1	1	0	1	0	0	0
V1	2250	0	390	14	329	1517
UJ1	1	0	1	0	0	0
Total	3025	464	700	14	329	1518
Total Validated	0%	0%	0%	0%	0%	0%
Percent Validated	0%	0%	0%	0%	0%	0%
Total Verified	2561	0	700	14	329	1518
Percent Verified	0 84661157	0	1	1	1	1
Percent Rejected	0%	0%	0%	0%	0%	0%

Key
V1, V – Verified, Validated w/ no qualifications
J, J1 – Estimated
UJ1 – No detection at the estimated detection limit
1 Verified

5.0 REFERENCES

DOE, 1992-2001, Historical Release Reports for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 1999, Order 414 1A, Quality Assurance

DOE, 2000, Rocky Flats Cleanup Agreement (RFCA), Attachment 5, March

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2002a, Industrial Area Sampling and Analysis Plan Addendum #IA-03-02, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January

DOE, CDPHE and EPA, 2003, RFCA Modifications, Rocky Flats Environmental Technology Site, Golden, Colorado, June

EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process

EPA 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review

EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review

EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process, Practical Methods for Data Analysis

Kaiser-Hill (K-H), 2002a, General Guidelines for Data Verification and Validation, DA-GR01-v1, October

K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, October

K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v1, October

K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v1, October

K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v1, October

Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5

19/19